S01P1115

FIG. 1

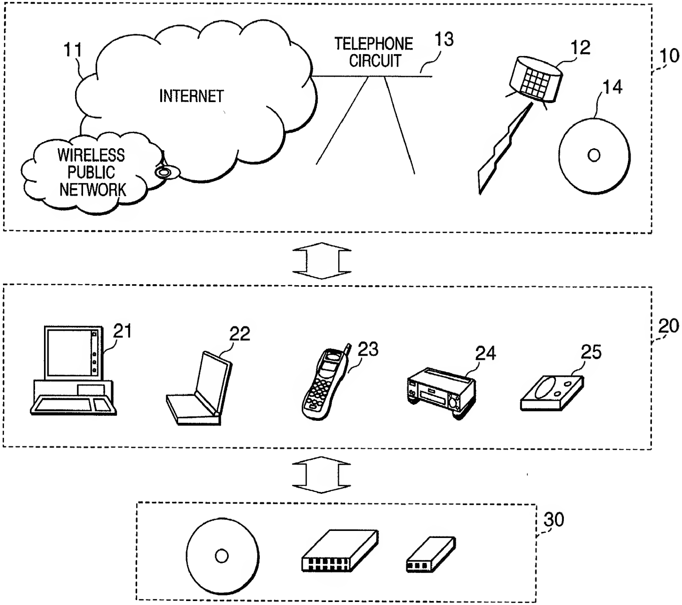


FIG. 2

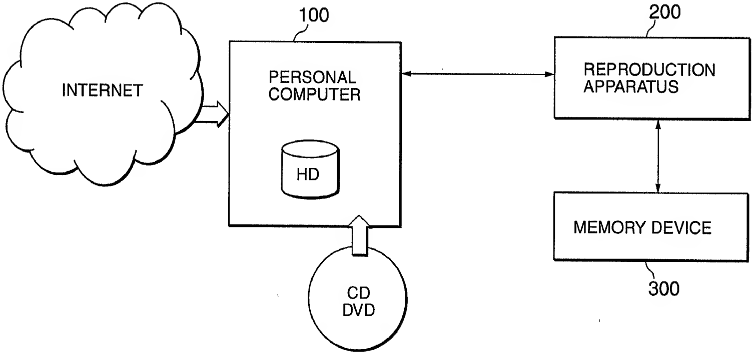

INTERNET
100
PERSONAL COMPUTER
HD
CD
DVD
200
REPRODUCTION APPARATUS
MEMORY DEVICE
300

FIG. 3

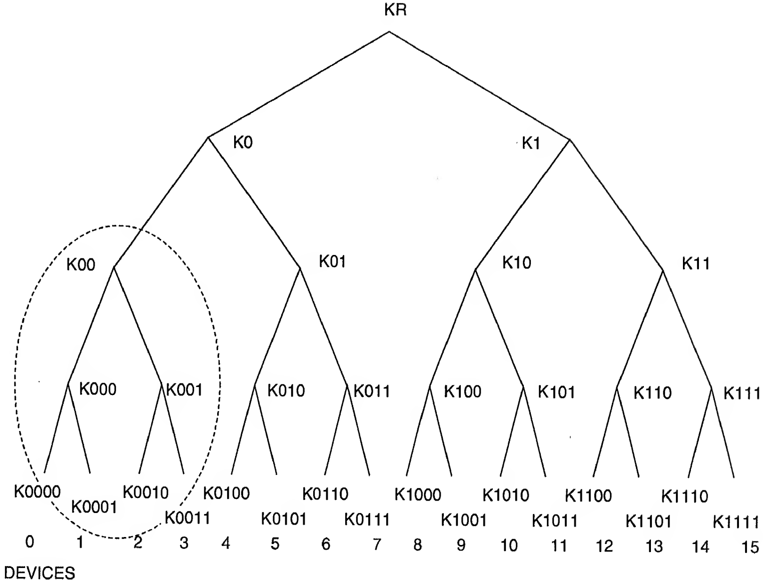

KR
K0
K1
K00
K01
K10
K11
K000
K001
K010
K011
K100
K101
K110
K111
K0000
K0001
K0010
K0011
K0100
K0101
K0110
K0111
K1000
K1001
K1010
K1011
K1100
K1101
K1110
K1111
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
DEVICES

FIG. 4

(A)

EKB (ENABLING KEY BLOCK) EXAMPLE 1
DELIVERS NODE KEYS OF VERSION (t) TO DEVICES 0, 1,AND 2

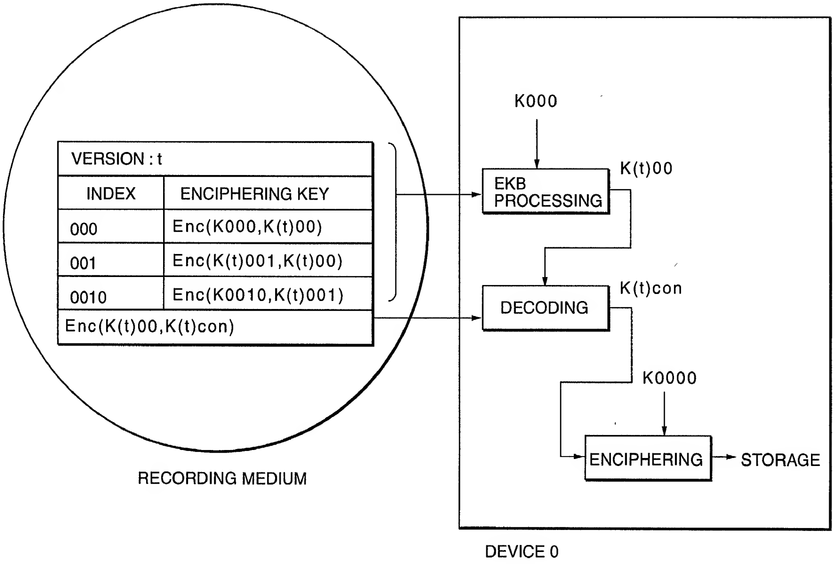
VERSION : t	
INDEX	ENCIPHERING KEY
0	Enc(K(t)0, K(t)R)
00	Enc(K(t)00, K(t)0)
000	Enc(K000, K(t)00)
001	Enc(K(t)001, K(t)00)
0010	Enc(K0010, K(t)001)

(B)

EKB (ENABLING KEY BLOCK) EXAMPLE 2
DELIVER NODE KEY OF VERSION (t) TO DEVICES 0, 1, AND 2

VERSION : t	
INDEX	ENCIPHERING KEY
000	Enc(K000, K(t)00)
001	Enc(K(t)001, K(t)00)
0010	Enc(K0010, K(t)001)

FIG. 5



VERSION : t	
INDEX	ENCIPHERING KEY
000	Enc(K000,K(t)00)
001	Enc(K(t)001,K(t)00)
0010	Enc(K0010,K(t)001)
Enc(K(t)00,K(t)con)	

FIG. 6

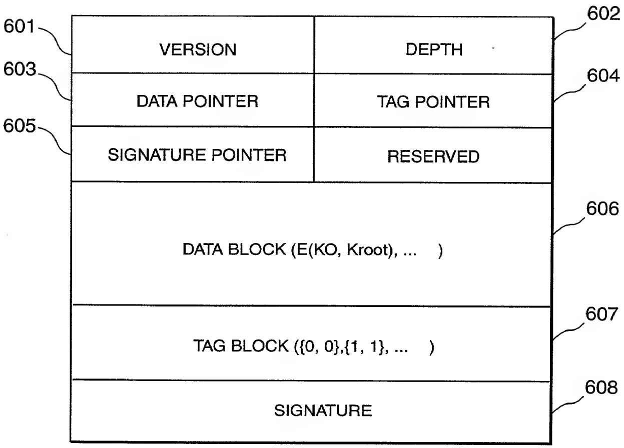
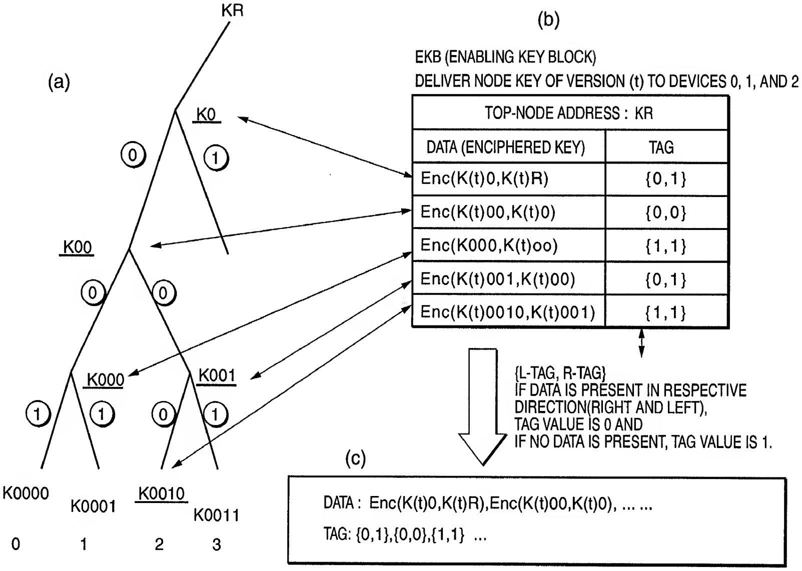

601
VERSION
DEPTH
602
603
DATA POINTER
TAG POINTER
604
605
SIGNATURE POINTER
RESERVED
DATA BLOCK (E(KO, Kroot), ...)
606
TAG BLOCK ({0, 0},{1, 1}, ...)
607
SIGNATURE
608

FIG. 7



EKB (ENABLING KEY BLOCK)

DELIVER NODE KEY OF VERSION (t) TO DEVICES 0, 1, AND 2

TOP-NODE ADDRESS : KR	
DATA (ENCIPHERED KEY)	TAG
Enc(K(t)0,K(t)R)	{0,1}
Enc(K(t)00,K(t)0)	{0,0}
Enc(K000,K(t)oo)	{1,1}
Enc(K(t)001,K(t)00)	{0,1}
Enc(K(t)0010,K(t)001)	{1,1}

{L-TAG, R-TAG}
IF DATA IS PRESENT IN RESPECTIVE DIRECTION(RIGHT AND LEFT), TAG VALUE IS 0 AND
IF NO DATA IS PRESENT, TAG VALUE IS 1.

DATA : Enc(K(t)0,K(t)R),Enc(K(t)00,K(t)0), ...

TAG: {0,1},{0,0},{1,1} ...

FIG. 8

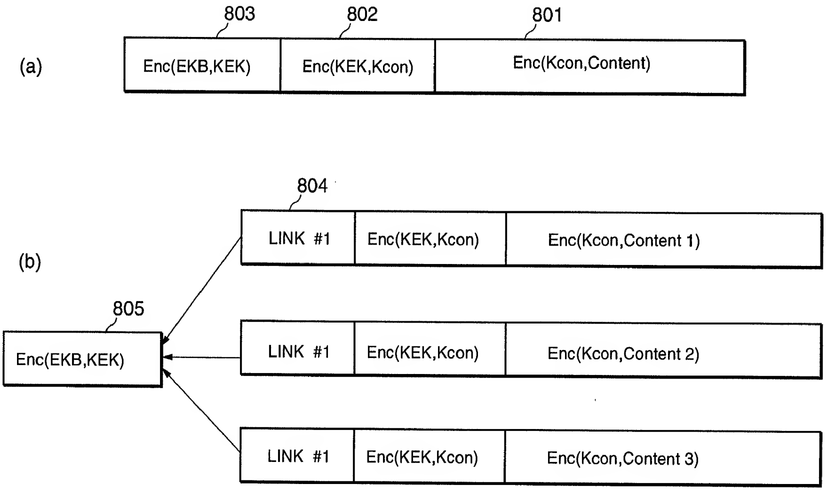
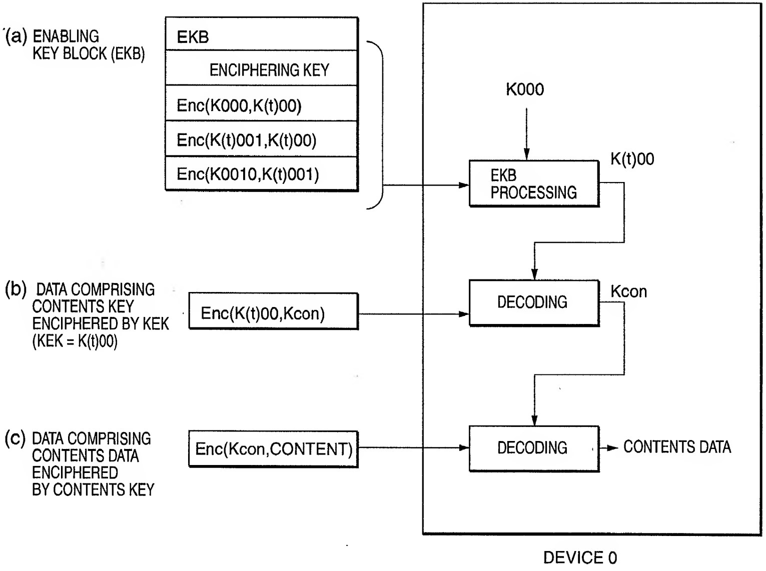
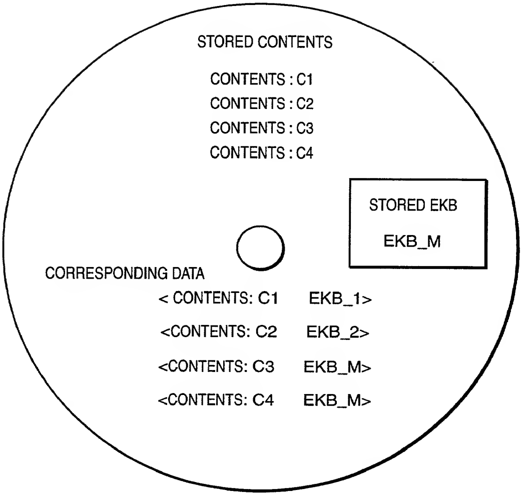

(a)
803
802
801
Enc(EKB,KEK)
Enc(KEK,Kcon)
Enc(Kcon,Content)
(b)
804
805
Enc(EKB,KEK)
LINK #1
Enc(KEK,Kcon)
Enc(Kcon,Content 1)
LINK #1
Enc(KEK,Kcon)
Enc(Kcon,Content 2)
LINK #1
Enc(KEK,Kcon)
Enc(Kcon,Content 3)

FIG. 9



(a) ENABLING KEY BLOCK (EKB)
EKB
ENCIPHERING KEY
Enc(K000,K(t)00)
Enc(K(t)001,K(t)00)
Enc(K0010,K(t)001)
(b) DATA COMPRISING CONTENTS KEY ENCIPHERED BY KEK (KEK = K(t)00)
Enc(K(t)00,Kcon)
(c) DATA COMPRISING CONTENTS DATA ENCIPHERED BY CONTENTS KEY
Enc(Kcon,CONTENT)
K000
EKB PROCESSING
K(t)00
DECODING
Kcon
DECODING
CONTENTS DATA
DEVICE 0

FIG. 10



RECORDING MEDIUM

FIG. 11

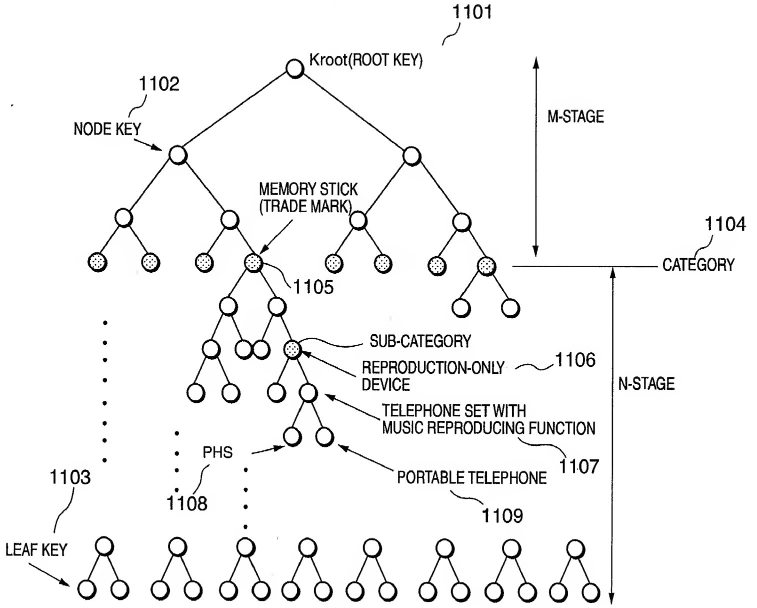
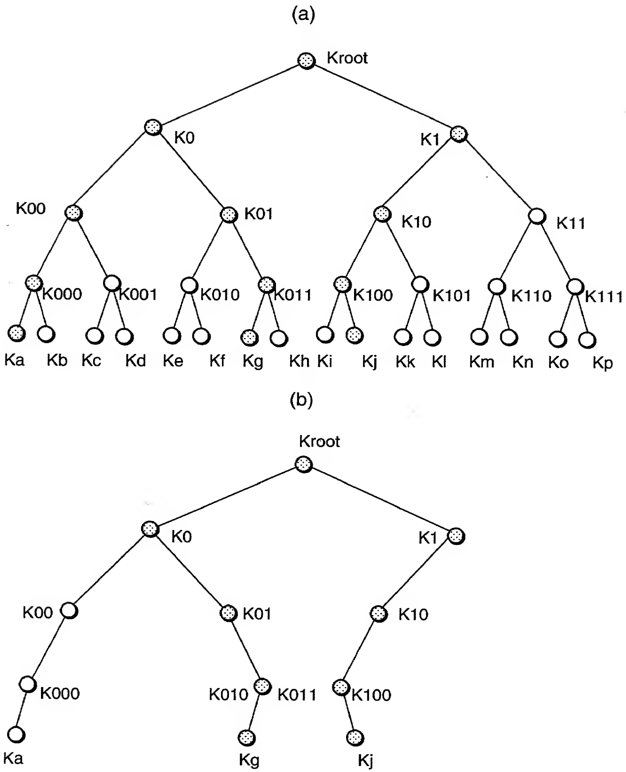

1101
Kroot(ROOT KEY)
1102
NODE KEY
M-STAGE
MEMORY STICK
(TRADE MARK)
1104
CATEGORY
1105
SUB-CATEGORY
REPRODUCTION-ONLY
DEVICE
1106
N-STAGE
TELEPHONE SET WITH
MUSIC REPRODUCING FUNCTION
PHS
1107
1103
PORTABLE TELEPHONE
1108
1109
LEAF KEY

FIG. 12



(a)

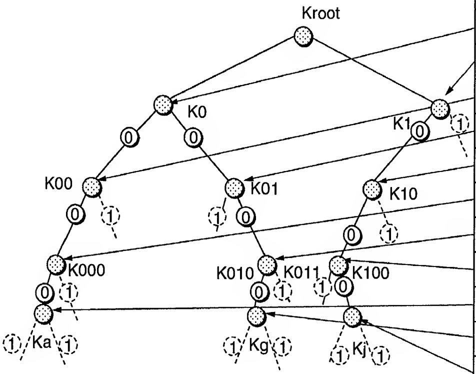
Kroot
K0
K1
K00
K01
K10
K11
K000
K001
K010
K011
K100
K101
K110
K111
Ka
Kb
Kc
Kd
Ke
Kf
Kg
Kh
Ki
Kj
Kk
Kl
Km
Kn
Ko
Kp

(b)

Kroot
K0
K1
K00
K01
K10
K000
K010
K011
K100
Ka
Kg
Kj

FIG. 13

(a)

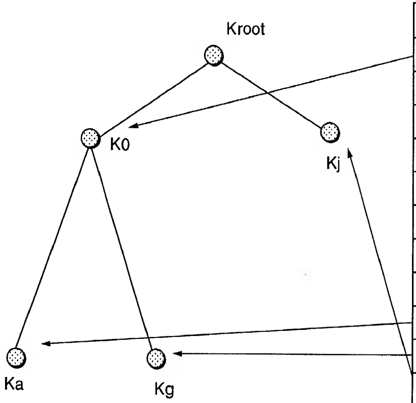


(b)

TAG	DATA(ENCIPHERING KEY)
{0, 0}	Enc(K(t)0,K(t)root)
{0, 1}	Enc(K(t)1,K(t)root)
{0, 1}	Enc(K(t)00,K(t)0)
{1, 0}	Enc(K(t)01,K(t)0)
{0, 1}	Enc(K(t)10,K(t)1)
{0, 1}	Enc(K(t)000,K(t)00)
{0, 1}	Enc(K(t)011,K(t)01)
{1, 0}	Enc(K(t)100,K(t)10)
{1, 1}	Enc(Ka,K(t)000)
{1, 1}	Enc(Kg,K(t)011)
{1, 1}	Enc(Kj,K(t)100)
Enc(K(t)root, K(t)con)	

FIG. 14

(a)



(b)

TAG	DATA(ENCIPHERING KEY)
{0, 0, 1}	Enc(K(t)0,K(t)root)
{0, 1, 0}	—
{0, 1, 0}	—
{1, 0, 0}	—
{0, 1, 0}	—
{0, 1, 0}	—
{0, 1, 0}	—
{1, 0, 0}	—
{1, 1, 1}	Enc(Ka,K(t)0)
{1, 1, 1}	Enc(Kg,K(t)0)
{1, 1, 1}	Enc(Kj,K(t)root)
Enc(K(t)root, K(t)con)	

FIG. 15

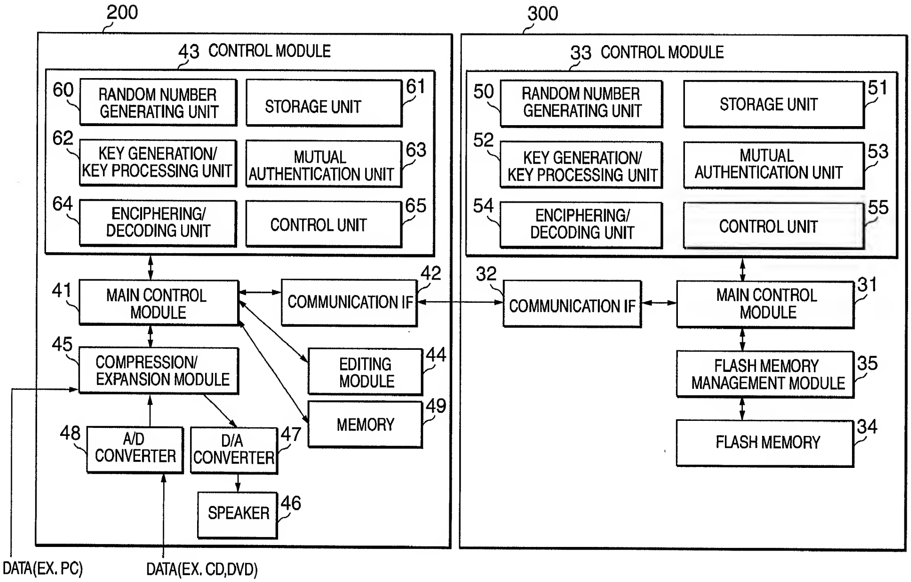

200
43 CONTROL MODULE
60
RANDOM NUMBER GENERATING UNIT
61
STORAGE UNIT
62
KEY GENERATION/ KEY PROCESSING UNIT
63
MUTUAL AUTHENTICATION UNIT
64
ENCIPHERING/ DECODING UNIT
65
CONTROL UNIT
41
MAIN CONTROL MODULE
42
COMMUNICATION IF
45
COMPRESSION/ EXPANSION MODULE
44
EDITING MODULE
49
MEMORY
48
A/D CONVERTER
47
D/A CONVERTER
46
SPEAKER
DATA(EX. PC)
DATA(EX. CD,DVD)
300
33 CONTROL MODULE
50
RANDOM NUMBER GENERATING UNIT
51
STORAGE UNIT
52
KEY GENERATION/ KEY PROCESSING UNIT
53
MUTUAL AUTHENTICATION UNIT
54
ENCIPHERING/ DECODING UNIT
55
CONTROL UNIT
32
COMMUNICATION IF
31
MAIN CONTROL MODULE
35
FLASH MEMORY MANAGEMENT MODULE
34
FLASH MEMORY

FIG. 16

DATA STORED IN A STORAGE UNIT OF A MEMORY DEVICE

AUTHENTICATION KEY DATA	IK0 IK1 IK2 IK3 : : IK30 IK31
DEVICE IDENTIFICATION DATA	ID0
STORAGE KEY DATA	Kstm

FIG. 17

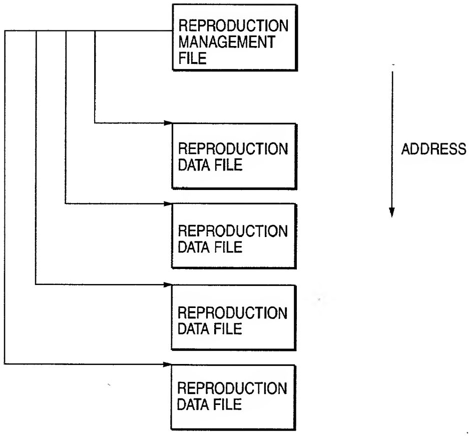

REPRODUCTION MANAGEMENT FILE
REPRODUCTION DATA FILE
REPRODUCTION DATA FILE
REPRODUCTION DATA FILE
REPRODUCTION DATA FILE
ADDRESS

FIG. 18

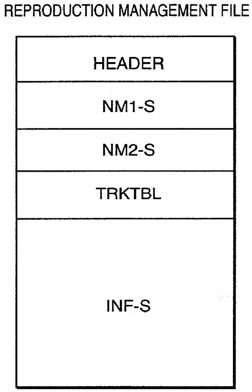

REPRODUCTION MANAGEMENT FILE
HEADER
NM1-S
NM2-S
TRKTBL
INF-S

FIG. 19

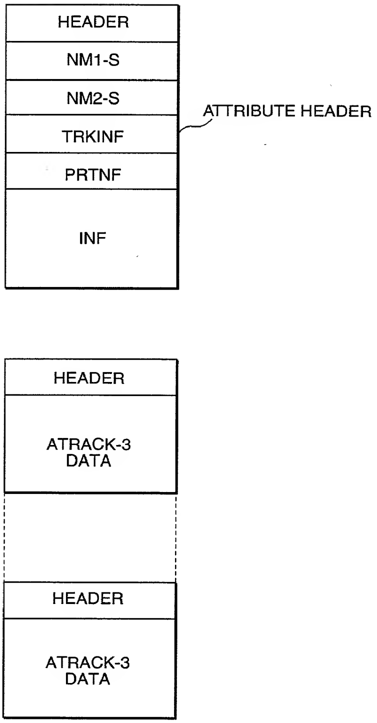

HEADER
NM1-S
NM2-S
TRKINF
PRTNF
INF
ATTRIBUTE HEADER
HEADER
ATRACK-3 DATA
HEADER
ATRACK-3 DATA

FIG. 20

REPRODUCTION MANAGEMENT FILE

A

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0x0000	BLKID-TLO				RESERVED		MCODE		REVISION				RESERVED			
0x0010	SN1C+L		SN2C+L		SINFSIZE		T-TRK		VerNo.		RESERVED					

B

0x0020	NM1-S(256)															
0x0120	NM2-S(512)															
0x0310																
0x0320	RESERVED(4)				EKB VERSION				E(Kstm,Kcon)							
0x0330	E(KEKn,Kcon)								c_MAC[0]							
0x0340	RESERVED(8)								RESERVED(3)			MGR	S-YMDhms			
0x0350	TRK-001		TRK-002		TRK-003		TRK-004		TRK-005		TRK-006		TRK-007		TRK-008	
0x0360	TRK-009		TRK-010		TRK-011		TRK-012		TRK-013		TRK-014		TRK-015		TRK-016	
0x0660	TRK-393		TRK-394		TRK-395		TRK-396		TRK-397		TRK-398		TRK-399		TRK-400	
0x0670	INF-S(14720)															
0x3FFF	BLKID-TLO				RESERVED		MCODE		REVISION				RESERVED			

C

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
INF	0X00	ID	0X00	SIZE		MCODE		C+L		RESERVED		DATA			

FIG. 20

REPRODUCTION MANAGEMENT FILE

A

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0x0000	BLKID-TLO				RESERVED		MCODE		REVISION				RESERVED			
0x0010	SN1C+L		SN2C+L		SINFSIZE		T-TRK		VerNo.		RESERVED					

B

0x0020	NM1-S(256)							
0x0120	NM2-S(512)							
0x0310								
0x0320	RESERVED(4)		EKB VERSION		E(Kstm,Kcon)			
0x0330	E(KEKn,Kcon)				c_MAC[0]			
0x0340	RESERVED(8)				RESERVED(3)	MGR	S-YMDhms	
0x0350	TRK-001	TRK-002	TRK-003	TRK-004	TRK-005	TRK-006	TRK-007	TRK-008
0x0360	TRK-009	TRK-010	TRK-011	TRK-012	TRK-013	TRK-014	TRK-015	TRK-016
0x0660	TRK-393	TRK-394	TRK-395	TRK-396	TRK-397	TRK-398	TRK-399	TRK-400
0x0670	INF-S(14720)							
0x3FFF	BLKID-TLO		RESERVED	MCODE	REVISION		RESERVED	

C

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
INF	0X00	ID	0X00	SIZE		MCODE		C+L		RESERVED		DATA VARIABLE LENGTH			

FIG. 21

ATRACK-3 DATA FILE

<table>
<tr><th></th><th>0</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>F</th></tr>
<tr><td>0x0000</td><td colspan="4">BLKID-HDO</td><td colspan="2">RESERVED</td><td colspan="2">MCODE</td><td colspan="4">RESERVED</td><td colspan="4">BLOCK SERIAL</td></tr>
<tr><td>0x0010</td><td colspan="2">N1C+L</td><td colspan="2">N2C+L</td><td colspan="2">INFSIZE</td><td colspan="2">T-PRT</td><td colspan="4">T-SU</td><td colspan="2">INX</td><td colspan="2">XT</td></tr>
<tr><td>0x0020</td><td colspan="16">NM1-S(256)</td></tr>
<tr><td>0x0120</td><td colspan="16">NM2-S(512)</td></tr>
<tr><td>0x0310</td><td colspan="16"></td></tr>
<tr><td>0x0320</td><td colspan="3">RESERVED(3)</td><td>EKI</td><td colspan="4">EKB VERSION</td><td colspan="8">E(Kstm, Kcon)</td></tr>
<tr><td>0x0330</td><td colspan="8">E(KEKn. Kcon)</td><td colspan="8">C_MAC[n]</td></tr>
<tr><td>0x0340</td><td colspan="8">RESERVED(8)</td><td colspan="4">INF_seq#</td><td>A</td><td>LT</td><td colspan="2">FNo</td></tr>
<tr><td>0x0350</td><td colspan="8">MG(D)SERIAL-nnn(Upper)</td><td colspan="8">MG(D)SERIAL-nnn(LOWER)</td></tr>
<tr><td>0x0360</td><td colspan="4">CONNUM</td><td colspan="4">YMDhms-S</td><td colspan="4">YMDhms-E</td><td>XCC</td><td>CT</td><td>CC</td><td>CN</td></tr>
<tr><td>0x0370</td><td colspan="4">PRTSIZE</td><td colspan="8">PRTKEY</td><td colspan="4">RESERVED(8)</td></tr>
<tr><td>0x0380</td><td colspan="4"></td><td colspan="4">CONNUMO</td><td colspan="4">PRTSIZE(0x0388)</td><td colspan="4">PRTKEY</td></tr>
<tr><td>0x0390</td><td colspan="4"></td><td colspan="8">RESERVED(8)</td><td colspan="4">CONNUMO</td></tr>
<tr><td></td><td colspan="16">INF(0x0400)</td></tr>
<tr><td>0x3FFF</td><td colspan="4">BLKID-HDD</td><td colspan="2">RESERVED</td><td colspan="2">MCODE</td><td colspan="4">RESERVED</td><td colspan="4">BLOCK SERIAL</td></tr>
<tr><td>0x4000</td><td colspan="4">BLKID-A3D</td><td colspan="2">RESERVED</td><td colspan="2">MCODE</td><td colspan="4">CONNUMO</td><td colspan="4">BLOCK SERIAL</td></tr>
<tr><td>0x4010</td><td colspan="8">BLOCKSEED</td><td colspan="8">INTIALIZATION VECTOR</td></tr>
<tr><td>0x4020</td><td colspan="16">SU-000(NByte=384Byte)</td></tr>
<tr><td>0x41A0</td><td colspan="16">SU-001(NByte)</td></tr>
<tr><td>0x4320</td><td colspan="16">SU-002(NByte)</td></tr>
<tr><td>0x04A0</td><td colspan="16">SU-041(NByte)</td></tr>
<tr><td>0x7DA0</td><td colspan="16">RESERVED(NByte=208Byte)</td></tr>
<tr><td>0x7F20</td><td colspan="8">BLK SEED</td><td colspan="8"></td></tr>
<tr><td>0x7FF0</td><td colspan="4">BLKID-A3D</td><td colspan="2">RESERVED</td><td colspan="2">MCODE</td><td colspan="4">CONNUMO</td><td colspan="4">BLOCK SERIAL</td></tr>
</table>

FIG. 22

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0x0000	BLKID-HDO				RESERVED		MCODE		RESERVED				BLOCK SERIAL			
0x0010	N1C+L		N2C+L		INFSIZE		T-PRT		T-SU				INX		XT	
0x0020	NM1-S(256)															
0x0120	NM2-S(512)															
0x0310																

FIG. 23

0x0320	RESERVED(3)	EKI	EKB VERSION	E(Kstm, Kcon)				
0x0330	E(KEKn, Kcon)			C_MAC[n]				
0x0340	RESERVED(8)			INF_seq#	A	LT	FNo	
0x0350	MG(D)SERIAL-nnn(UPPER)			MG(D)SERIAL-nnn(LOWER)				
0x0360	CONNUM		YMDhms-S	YMDhms-E	XCC	CT	CC	CN

FIG. 24

Bit7 : ATRAC3 Mode 0 : Dual 1 : Joint

Bits 6, 5, 4: N OF 3-Bit CORRESPONDS TO MODE VALUE

N	MODE	TIME	TRANSFER RATE	SU (SOUND UNIT)	Byte
7	HQ	47min	176kbps	31SU	512
6		58min	146kbps	38SU	424
5	EX	64min	132kbps	42SU	384
4	SP	81min	105kbps	53SU	304
3		90min	94kbps	59SU	272
2	LP	128min	66kbps	84SU	192
1	MONO	181min	47kbps	119SU	136
0	MONO	258min	33kbps	169SU	96

Bit3 : RESERVED		
Bit2 : DATA DISTINCTION	0 : AUDIO	1 : OTHERS
Bit1 : REPRODUCED SKIP	0 : NORMAL REPRODUCTION	1 : SKIP
Bit0 : EMPHASIS	0 : OFF	1 : ON(50/15 μ SECCOND)

FIG. 25

Bit7 : COPY APPROVAL 0 : COPY INHIBITED 1 : COPY APPROVED

Bit6 : GENERATION (VERSION) 0 : ORIGINAL 1 : BEYOND THE FIRST GENERATION

HCMS Bit5-4 : CONTROL IN RELATION TO HIGH-SPEED DIGITAL COPYING OPERATION

00 : COPY INHIBITED 01 : COPY FOR THE FIRST GENERATION 10 : COPY APPROVED

CHILD WHO IMPLEMENTED COPYING OF THE FIRST GENERATION IS INHIBITED FROM EXECUTING FURTHER COPYING OPERASTION

Bit3-2 : MAGIC GATE AUTHENTICATION LEVEL

00: LEVEL10(Non-MG)	01 : LEVEL1
02: LEVEL12	11 : RESERVED
02: LEVEL10	

THOSE LEVELS OTHER THAN 10 CAN NOT BE DIVIDED NOR COMBINED

Bit1, 0 : RESERVED

FIG. 26

0x0370	PRTSIZE	PRTKEY		RESERVED (8)
0x0380		CONNUMO	PRTSIZE(0x0388)	PRTKEY
0x0390		RESERVED (8)		CONNUMO

FIG. 27

0x4000	BLKID-A3D	RESERVED	MCODE	CONNUMO	BLOCK SERIAL
0x4010	BLOCKSEED			INTIALIZATION VECTOR	
0x4020	SU-000(NByte=384Byte)				

FIG. 28

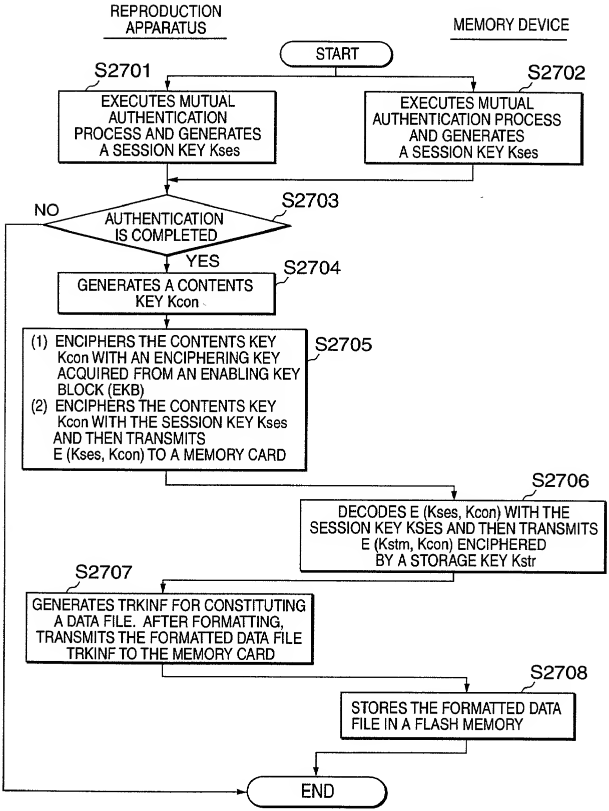
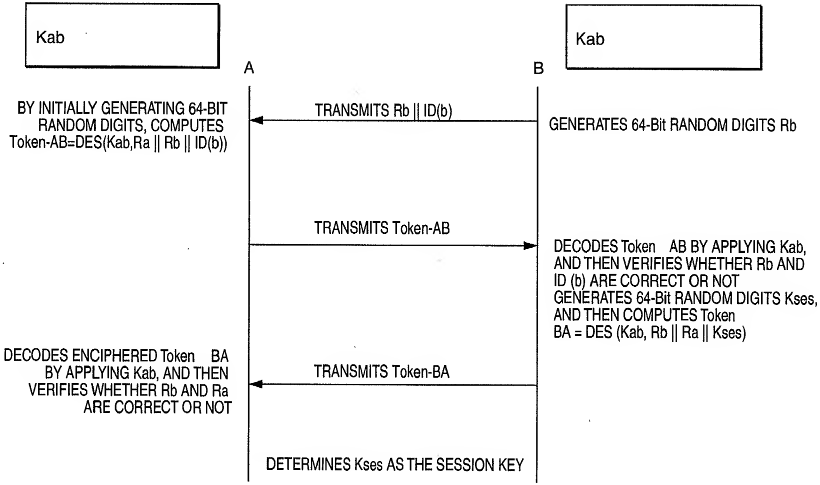

REPRODUCTION APPARATUS
MEMORY DEVICE
START
S2701
EXECUTES MUTUAL AUTHENTICATION PROCESS AND GENERATES A SESSION KEY Kses
S2702
EXECUTES MUTUAL AUTHENTICATION PROCESS AND GENERATES A SESSION KEY Kses
S2703
NO
AUTHENTICATION IS COMPLETED
YES
S2704
GENERATES A CONTENTS KEY Kcon
S2705
(1) ENCIPHERS THE CONTENTS KEY Kcon WITH AN ENCIPHERING KEY ACQUIRED FROM AN ENABLING KEY BLOCK (EKB)
(2) ENCIPHERS THE CONTENTS KEY Kcon WITH THE SESSION KEY Kses AND THEN TRANSMITS E (Kses, Kcon) TO A MEMORY CARD
S2706
DECODES E (Kses, Kcon) WITH THE SESSION KEY KSES AND THEN TRANSMITS E (Kstm, Kcon) ENCIPHERED BY A STORAGE KEY Kstr
S2707
GENERATES TRKINF FOR CONSTITUTING A DATA FILE. AFTER FORMATTING, TRANSMITS THE FORMATTED DATA FILE TRKINF TO THE MEMORY CARD
S2708
STORES THE FORMATTED DATA FILE IN A FLASH MEMORY
END

FIG. 29


Kab
Kab
A
B
BY INITIALLY GENERATING 64-BIT RANDOM DIGITS, COMPUTES Token-AB=DES(Kab,Ra || Rb || ID(b))
TRANSMITS Rb || ID(b)
GENERATES 64-Bit RANDOM DIGITS Rb
TRANSMITS Token-AB
DECODES Token AB BY APPLYING Kab, AND THEN VERIFIES WHETHER Rb AND ID (b) ARE CORRECT OR NOT GENERATES 64-Bit RANDOM DIGITS Kses, AND THEN COMPUTES Token BA = DES (Kab, Rb || Ra || Kses)
DECODES ENCIPHERED Token BA BY APPLYING Kab, AND THEN VERIFIES WHETHER Rb AND Ra ARE CORRECT OR NOT
TRANSMITS Token-BA
DETERMINES Kses AS THE SESSION KEY

MUTUAL AUTHENTICATION FORMAT AND KEY-COMMUNIZING FORMAT VIA UTILIZATION OF THE ISO/IEC9798-2 STANDARD SYMMETRICAL KEY ENCIPHERING ART

FIG. 30

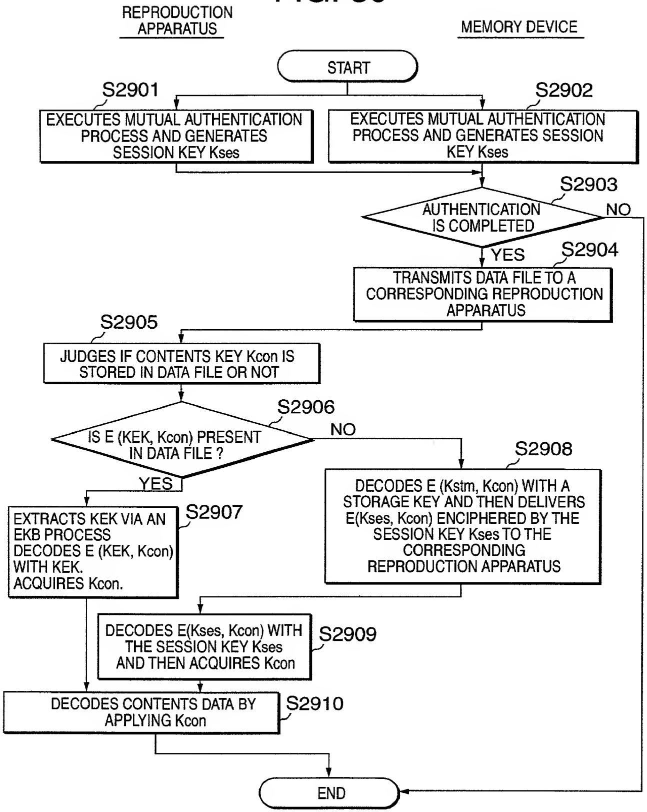

REPRODUCTION APPARATUS
MEMORY DEVICE
START
S2901
EXECUTES MUTUAL AUTHENTICATION PROCESS AND GENERATES SESSION KEY Kses
S2902
EXECUTES MUTUAL AUTHENTICATION PROCESS AND GENERATES SESSION KEY Kses
S2903
AUTHENTICATION IS COMPLETED
NO
YES
S2904
TRANSMITS DATA FILE TO A CORRESPONDING REPRODUCTION APPARATUS
S2905
JUDGES IF CONTENTS KEY Kcon IS STORED IN DATA FILE OR NOT
S2906
IS E (KEK, Kcon) PRESENT IN DATA FILE ?
NO
YES
S2908
DECODES E (Kstm, Kcon) WITH A STORAGE KEY AND THEN DELIVERS E(Kses, Kcon) ENCIPHERED BY THE SESSION KEY Kses TO THE CORRESPONDING REPRODUCTION APPARATUS
S2907
EXTRACTS KEK VIA AN EKB PROCESS DECODES E (KEK, Kcon) WITH KEK. ACQUIRES Kcon.
DECODES E(Kses, Kcon) WITH THE SESSION KEY Kses AND THEN ACQUIRES Kcon
S2909
DECODES CONTENTS DATA BY APPLYING Kcon
S2910
END

FIG. 31

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0x0000	BLKID-EKB				RESERVED		MCODE		RESERVED(3)			LKF	LINK COUNT			
0x0010	RESERVED(8)								RESERVED(8)							
0x0020	VERSION				EA	RESERVED			KEK1							
0x0030	KEK2								E(VERSION)							
0x0040	SIZE OF TAG PART				SIZE OF KEY PART				SIZE OF SIGN PART							
0x0050	TAG PART ({X,O,O}, {X,1,1}. . . . .) FILL TO 64Bit ALIGNMENT															
	KEY PART															
	SIGNATURE															

FIG. 32

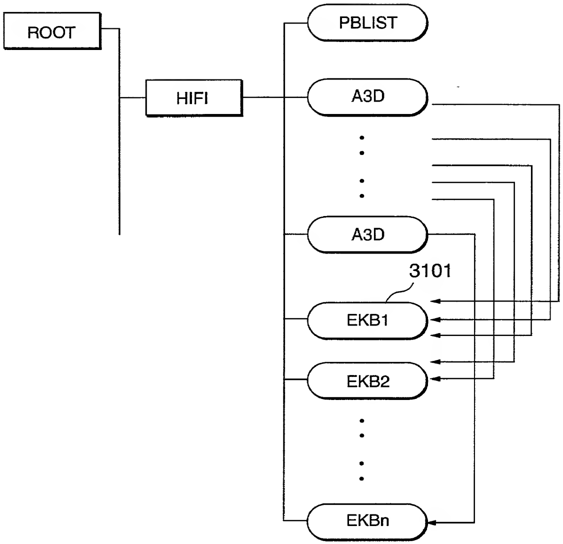


FIG. 33

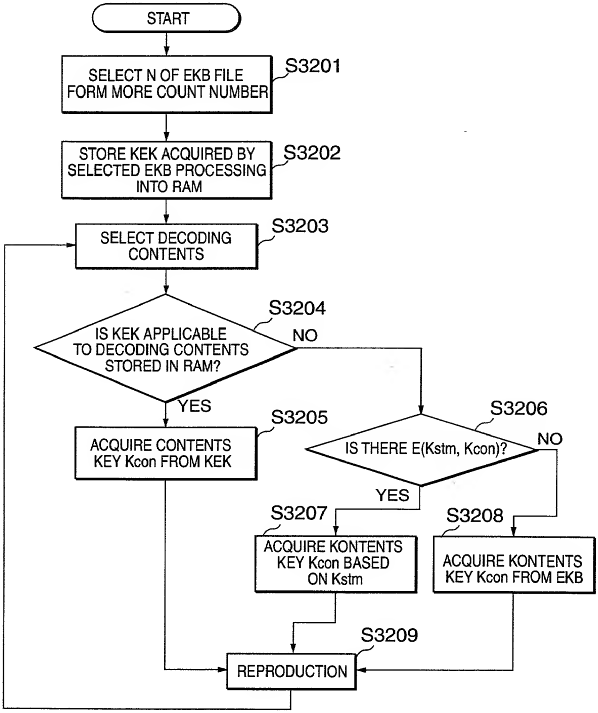

START
SELECT N OF EKB FILE FORM MORE COUNT NUMBER
S3201
STORE KEK ACQUIRED BY SELECTED EKB PROCESSING INTO RAM
S3202
SELECT DECODING CONTENTS
S3203
IS KEK APPLICABLE TO DECODING CONTENTS STORED IN RAM?
S3204
NO
YES
ACQUIRE CONTENTS KEY Kcon FROM KEK
S3205
IS THERE E(Kstm, Kcon)?
S3206
NO
YES
S3207
ACQUIRE KONTENTS KEY Kcon BASED ON Kstm
S3208
ACQUIRE KONTENTS KEY Kcon FROM EKB
S3209
REPRODUCTION

FIG. 34

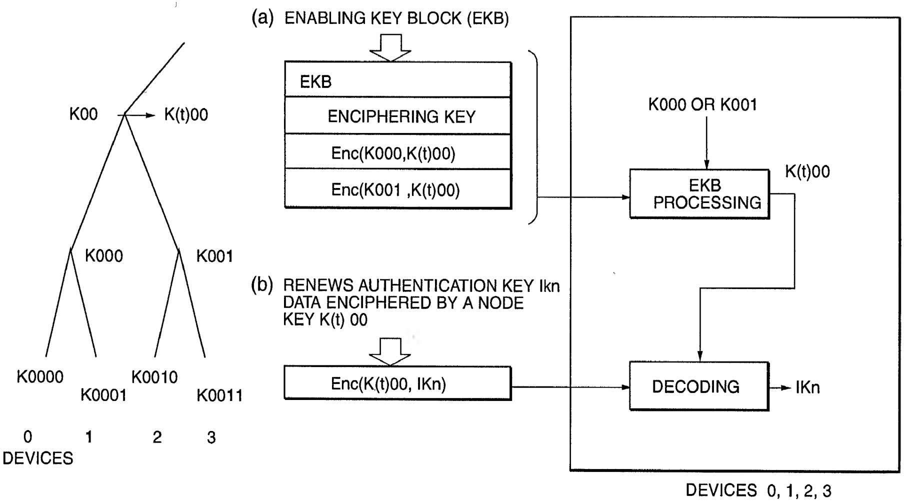

K00
K(t)00
K000
K001
K0000
K0001
K0010
K0011
0
1
2
3
DEVICES
(a) ENABLING KEY BLOCK (EKB)
EKB
ENCIPHERING KEY
Enc(K000,K(t)00)
Enc(K001 ,K(t)00)
(b) RENEWS AUTHENTICATION KEY Ikn DATA ENCIPHERED BY A NODE KEY K(t) 00
Enc(K(t)00, IKn)
K000 OR K001
EKB PROCESSING
K(t)00
DECODING
IKn
DEVICES 0, 1, 2, 3

FIG. 35

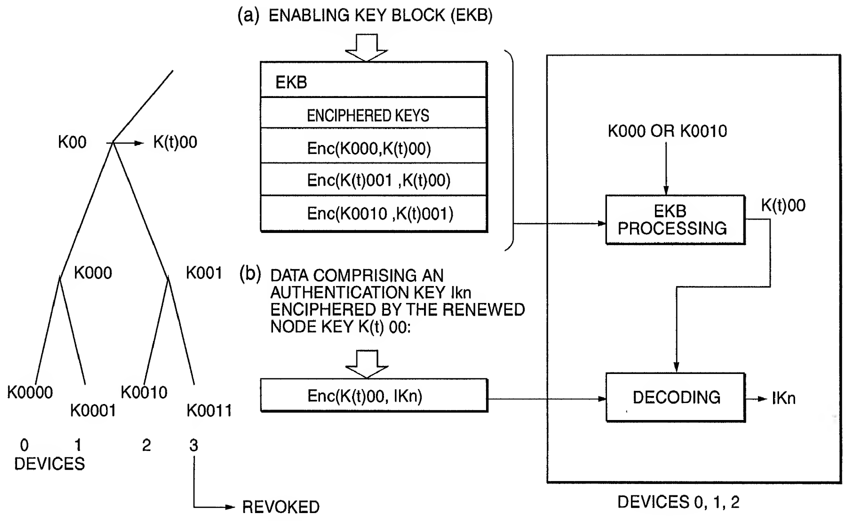

(a) ENABLING KEY BLOCK (EKB)
EKB
ENCIPHERED KEYS
Enc(K000,K(t)00)
Enc(K(t)001 ,K(t)00)
Enc(K0010 ,K(t)001)
(b) DATA COMPRISING AN AUTHENTICATION KEY Ikn ENCIPHERED BY THE RENEWED NODE KEY K(t) 00:
Enc(K(t)00, IKn)
K00
K(t)00
K000
K001
K0000
K0001
K0010
K0011
0
1
2
3
DEVICES
REVOKED
K000 OR K0010
EKB PROCESSING
K(t)00
DECODING
IKn
DEVICES 0, 1, 2

FIG. 36

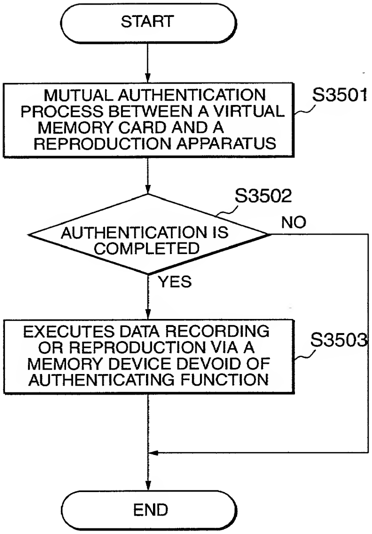
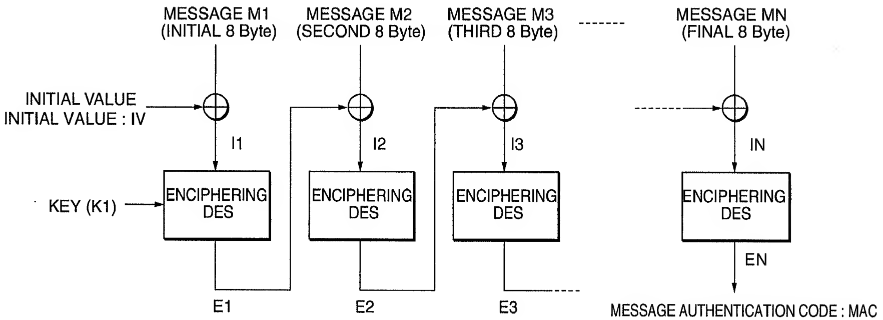

START
MUTUAL AUTHENTICATION PROCESS BETWEEN A VIRTUAL MEMORY CARD AND A REPRODUCTION APPARATUS
S3501
S3502
AUTHENTICATION IS COMPLETED
NO
YES
EXECUTES DATA RECORDING OR REPRODUCTION VIA A MEMORY DEVICE DEVOID OF AUTHENTICATING FUNCTION
S3503
END

FIG. 37



⊕ EXCLUSIVE OR PROCESS (8 Bytes UNIT)

FIG. 38

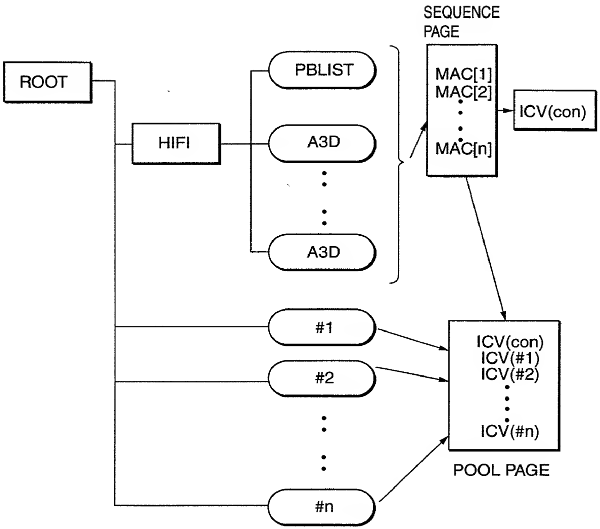

SEQUENCE PAGE
ROOT
HIFI
PBLIST
A3D
A3D
MAC[1]
MAC[2]
MAC[n]
ICV(con)
#1
#2
#n
ICV(con)
ICV(#1)
ICV(#2)
ICV(#n)
POOL PAGE

FIG. 39

SEQUENCE PAGE FORMAT

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0x0000	E(Kstr, Kcon)								RESERVED							
0x0010	ID(Upper)								IO(LOWER)							
0x0020	C_MAC[0] (PUBLIST)								C_MAC[1]							
0x0030	C_MAC[2]								C_MAC[3]							
								⋮								
								⋮								
								⋮								
0x0FF0	C_MAC[nnn]								RESERVED				REVISION			

FIG. 40

POOL PAGE FORMAT

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0x0000	#0_REVISION				#0_EKB VERSION				#0_E(KEK, Kicv)							
0x0010	#0_E(KEK, Kicv)								ICV0							
0x0020	#1_REVISION				#1_EKB VERSION				#1_E(KEK, Kicv)							
0x0030	#1_E (KEK,Kicv)								ICV1							
								⋮								
0x01E0	#15_REVISION				#15_EKB VERSION				#15_E(KEK, Kicv)							
0x01F0	#15_E (KEK,Kicv)								ICV15							

FIG. 41

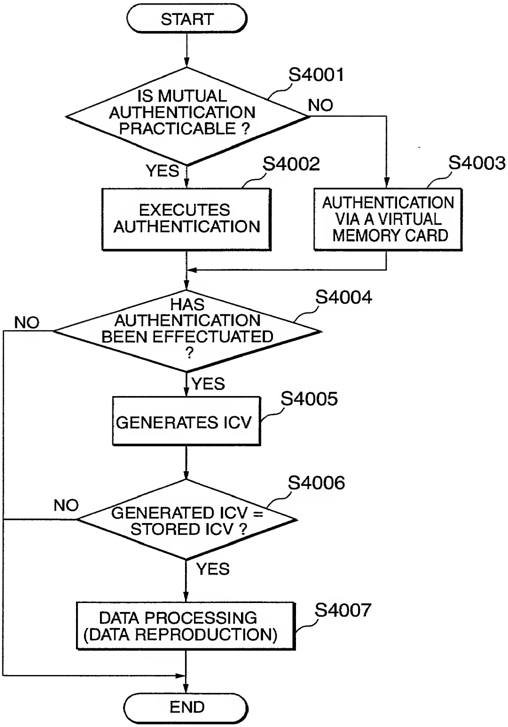

START
S4001
IS MUTUAL AUTHENTICATION PRACTICABLE ?
NO
YES
S4002
EXECUTES AUTHENTICATION
S4003
AUTHENTICATION VIA A VIRTUAL MEMORY CARD
S4004
NO
HAS AUTHENTICATION BEEN EFFECTUATED ?
YES
S4005
GENERATES ICV
S4006
NO
GENERATED ICV = STORED ICV ?
YES
S4007
DATA PROCESSING (DATA REPRODUCTION)
END

FIG. 42

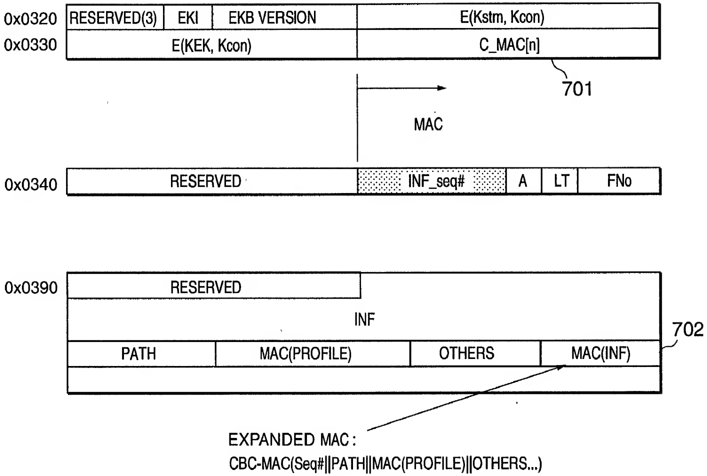

0x0320
RESERVED(3)
EKI
EKB VERSION
E(Kstm, Kcon)
0x0330
E(KEK, Kcon)
C_MAC[n]
701
MAC
0x0340
RESERVED
INF_seq#
A
LT
FNo
0x0390
RESERVED
INF
702
PATH
MAC(PROFILE)
OTHERS
MAC(INF)
EXPANDED MAC :
CBC-MAC(Seq#||PATH||MAC(PROFILE)||OTHERS...)

FIG. 43

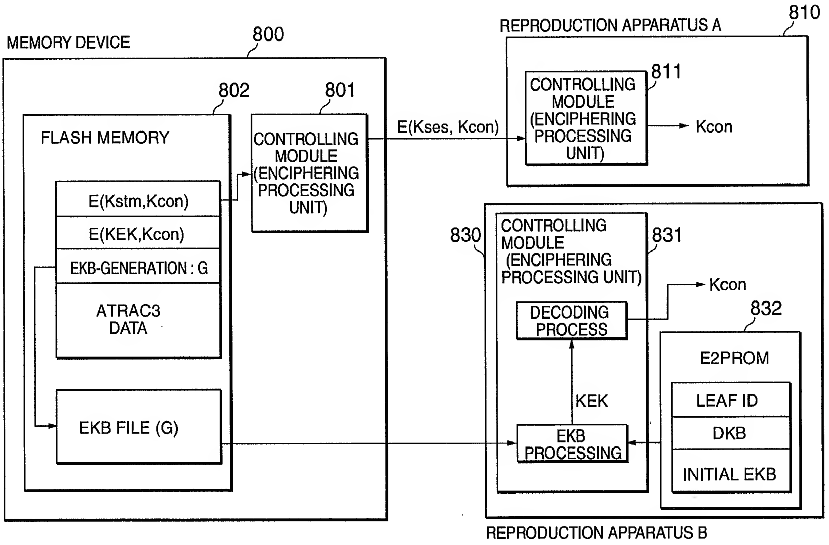
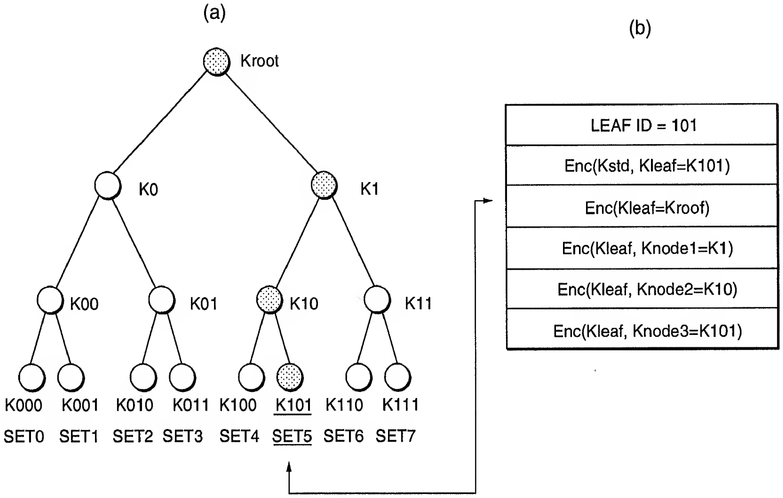
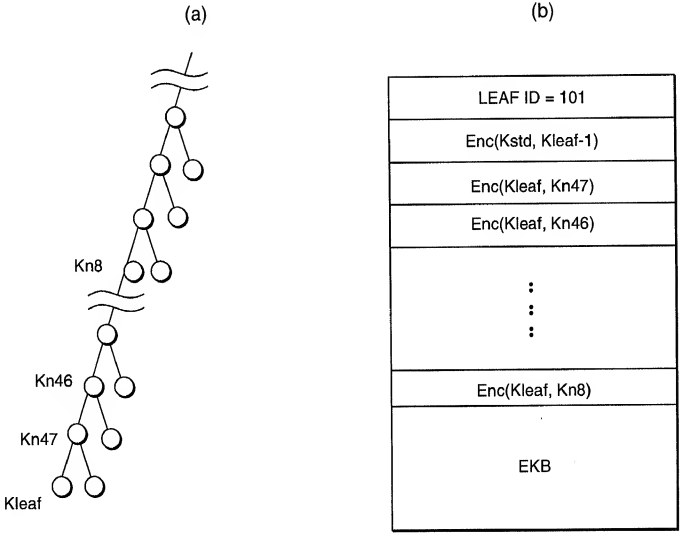

MEMORY DEVICE
800
802
801
FLASH MEMORY
E(Kstm,Kcon)
E(KEK,Kcon)
EKB-GENERATION : G
ATRAC3 DATA
EKB FILE (G)
CONTROLLING MODULE (ENCIPHERING PROCESSING UNIT)
E(Kses, Kcon)
REPRODUCTION APPARATUS A
810
811
CONTROLLING MODULE (ENCIPHERING PROCESSING UNIT)
Kcon
830
831
CONTROLLING MODULE (ENCIPHERING PROCESSING UNIT)
DECODING PROCESS
Kcon
KEK
EKB PROCESSING
832
E2PROM
LEAF ID
DKB
INITIAL EKB
REPRODUCTION APPARATUS B

FIG. 44



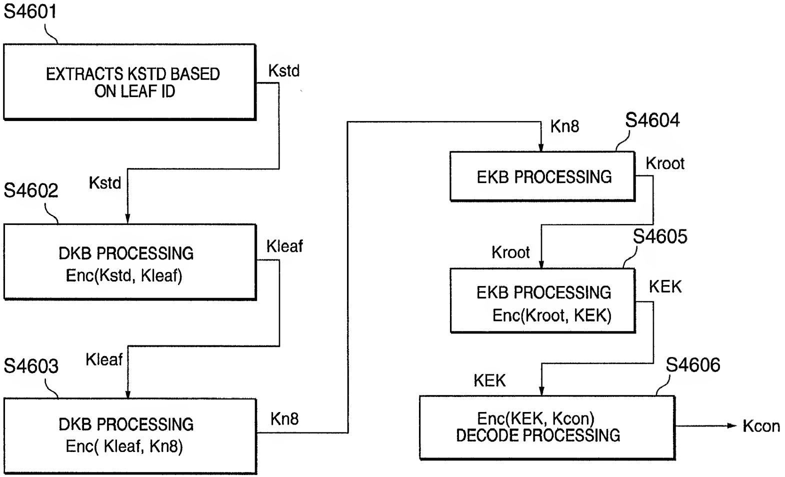
LEAF ID = 101
Enc(Kstd, Kleaf=K101)
Enc(Kleaf=Kroof)
Enc(Kleaf, Knode1=K1)
Enc(Kleaf, Knode2=K10)
Enc(Kleaf, Knode3=K101)

FIG. 45



LEAF ID = 101
Enc(Kstd, Kleaf-1)
Enc(Kleaf, Kn47)
Enc(Kleaf, Kn46)
⋮ ⋮ ⋮
Enc(Kleaf, Kn8)
EKB

FIG. 46


S4601
EXTRACTS KSTD BASED ON LEAF ID
Kstd
S4602
Kstd
DKB PROCESSING Enc(Kstd, Kleaf)
Kleaf
S4603
Kleaf
DKB PROCESSING Enc(Kleaf, Kn8)
Kn8
Kn8
S4604
EKB PROCESSING
Kroot
S4605
Kroot
EKB PROCESSING Enc(Kroot, KEK)
KEK
S4606
KEK
Enc(KEK, Kcon) DECODE PROCESSING
Kcon